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REMARKSInterview request

Applicants respectfully request a telephonic interview after the Examiner has reviewed the instant response and amendment. Applicants request the Examiner call Applicants' representative at (858) 720-5133.

Status of the Claims*Pending claims*

Claims 42 to 55 and 88 to 114 are pending.

Claims canceled and added in the instant amendment

Claims 97 to 100, 102, 104, 105, 108, 109 and 113 to 114 are canceled, without prejudice; and new claims 115 to 133 are added. Thus, after entry of these amendments, claims 42 to 55, 88 to 96, 101, 103, 106 to 107, 110 to 112 and 115 to 133 are pending and presented for consideration.

Claims only objected to

Applicants note, with appreciation, that claims 105 to 109 were only objected to. Please note that amended claims 106 and 107 now depend from new claim 126.

Response to the Restriction Requirement

The instant application was restricted to eight (VIII) inventions under 35 U.S.C. §121. Applicants elected Group IV, claims 42-55 and 88-92, drawn to a method of mutagenesis, with traverse.

I. Outstanding Rejections

Claims 88 to 92, 111 and 112, are rejected under 35 U.S.C. §112, second paragraph. Claims 88, 95 to 98, 110 and 112 are rejected under 35 U.S.C. §102(b) as allegedly anticipated by Knowles, et al., U.S. Patent No. 5,393,670, issued February 28, 1995, filed July 23, 1993 (hereinafter "Knowles"). Claims 88, 95 to 104 and 110 are rejected under 35 U.S.C. §102(e) as allegedly anticipated by Thomas, et al., U.S. Patent No. 5,536,655, issued July 16, 1996, filed July

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15, 1994 (hereinafter "Thomas"). Claims 42 to 55, 93, 94, 97, 98, 100, 111, are rejected under 35 U.S.C. §103(a) as allegedly unpatentable over Stemmer, U.S. Patent No. 6,277,638 (hereinafter "Stemmer"), in view of Knowles. Claims 42 to 55, 93, 94, 97 to 104, 110 and 111, are rejected under 35 U.S.C. §103(a) as allegedly unpatentable over Stemmer in view of Thomas.

Applicants respectfully traverse all outstanding objections to the specification and rejections of the claims.

Support for the Claim Amendments

The specification sets forth an extensive description of the invention in the new and amended claims. For example, support for claims directed to methods using nucleic acids comprising various fragments (e.g., at least 30, 35, 40, 50, 75, 100, 150, 200, 300, 400, or 500 consecutive bases of SEQ ID NO:1, or sequences complementary thereto) can be found, inter alia, on page 35, line 28 to page 36, line 6. Support for claims directed to methods using a nucleic acid having at least about 99%, 98%, 97%, 96%, 95%, 90%, 85%, 80%, 75%, 70%, 65%, 60%, 55%, or 50% sequence identity to an exemplary sequence of the invention can be found, inter alia, in the specification page 42, line 15, to page 43, line 2, and on page 56, lines 9 to 24. Support for claims directed to methods comprising identifying a nucleic acid modified by the method having an endoglucanase activity can be found, inter alia, in the specification page 5, line 28 to page 6, line 5. Support for claims directed to methods comprising modifying a nucleic acid encoding an endoglucanase, wherein the endoglucanase activity comprises a carboxymethyl cellulase activity, can be found, inter alia, on page 3, lines 5 to 6. Support for claims directed to methods using a nucleic acid that hybridizes under stringent conditions to an exemplary nucleic acid can be found, inter alia, from line 15, page 39, to line 13, page 42.

Issues under 35 U.S.C. §112, second paragraph

Claims 88 to 92 and 111 and 112 are rejected under 35 U.S.C. §112, second paragraph, as allegedly indefinite. The instant amendment addresses this issue.

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Issues under 35 U.S.C. §102*Knowles, et al., U.S. Patent No. 5,393,670*

Claims 88, 95 to 98, 110 and 112 are rejected under 35 U.S.C. §102(b) as allegedly anticipated by Knowles, et al., U.S. Patent No. 5,393,670, issued February 28, 1995, filed July 23, 1993.

The legal standard for anticipation under 35 U.S.C. §102 is one of strict identity. "A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." *Verdegaal Bros. v. Union Oil Co. of California*, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987); MPEP § 2131.

The Patent Office alleges that Knowles teaches a sequence having at least 50% sequence identity to SEQ ID NO:1 of the instant invention. The instant amendment addresses this issue. Claim 88, as amended, reads:

Claim 88 (currently amended): A method for modifying small molecules, comprising
providing a polypeptide encoded by a polynucleotide comprising a sequence having at least about 70% identity to SEQ ID NO:1 and encoding a polypeptide having an endoglucanase activity,
providing a small molecule; and
mixing the polypeptide with the small molecule to produce a modified small molecule.

Because Knowles is not a single prior art reference that teaches a polypeptide encoded by a polynucleotide comprising a sequence having at least about 70% identity to SEQ ID NO:1, claim 88 is not anticipated by Knowles.

Regarding claims 88 and 96, the Patent Office alleges that the phrase "comprising a sequence" on line 3 of claims 88 and 96 can be interpreted to mean two nucleotides all the way up to the full length of the exemplary nucleic acid sequence, SEQ ID NO:1.

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However, claim 96, as amended, reads:

Claim 96 (currently amended): A method for modifying a small molecule comprising:

providing a polypeptide having an endoglucanase activity, wherein the polypeptide is encoded by a nucleic acid comprising a sequence as set forth in SEQ ID NO:1;

providing a small molecule; and

mixing the polypeptide with the small molecule to produce a modified small molecule.

Claim 96 is directed to a method comprising providing a polypeptide having an endoglucanase activity that is encoded by a nucleic acid comprising a sequence as set forth in SEQ ID NO:1. SEQ ID NO:1 is a nucleic acid 1662 residues in length.

Applicants wish to clarify that they use the term "comprises" as an open-ended term. See, e.g., Invitrogen Corp. v. Biocrest Mfg., 327 F.3d 1364; 2003 U.S. App. LEXIS 8651; 66 U.S.P.Q.2D (BNA) 1631, 1634 (Fed. Cir. 2003). For example, when a polynucleotide comprises a nucleic acid comprising a sequence as set forth in SEQ ID NO:1, it can also comprise other compositions, e.g., RNA; or, a vector or a plasmid, or, additional sequences. However, the plain meaning of the claim reads on use of a nucleic acid at least comprising a sequence as set forth in SEQ ID NO:1, i.e., a nucleic acid at least 1662 residues in length having the sequence of SEQ ID NO:1.

As noted above, Knowles teaches a sequence having at least 50% sequence identity to SEQ ID NO:1. Thus, Knowles is not a single prior art reference that teaches each and every element of the claim 96.

The Patent Office alleges that Knowles teaches a sequence of at least 30 consecutive residues which has 18 out of 30, or 60% sequence identity to positions 2280 to 2309 of SEQ ID NO:1. The instant amendment addresses this issue. Claim 95, as amended, reads:

Claim 95 (currently amended): A method for modifying a small molecule comprising:

providing a polypeptide having an endoglucanase activity, wherein the polypeptide is encoded by a nucleic acid comprising at least 75 consecutive residues of a sequence having at least about 70% sequence identity to a sequence as set forth in SEQ ID NO:1;

providing a small molecule; and

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mixing the polypeptide with the small molecule to produce a modified small molecule.

Similarly, claim 112, as amended, reads:

Claim 112 (currently amended): A method for modifying a small molecule such that the small molecule will have a desired activity comprising:

providing a polypeptide having endoglucanase activity, wherein the polypeptide is encoded by a nucleic acid having at least about 70% sequence identity to a sequence as set forth in SEQ ID NO:1;

providing a small molecule;

mixing the polypeptide with the small molecule to produce a modified small molecule; and,

testing the modified small molecule for the desired activity.

Accordingly, the claimed invention cannot be anticipated by Knowles. Applicants respectfully request reconsideration and withdrawal of the rejection of the claims under 35 U.S.C. §102(b) as allegedly anticipated by Knowles.

Thomas, et al., U.S. Patent No. 5,536,655

Claims 88, 95 to 104 and 110 are rejected under 35 U.S.C. §102(e) as allegedly anticipated by Thomas, et al., U.S. Patent No. 5,536,655, issued July 16, 1996, filed July 15, 1994.

The Patent Office alleges that a sequence taught by Thomas (the 30 nucleotides residues numbered 1925 to 1954 of SEQ ID NO:6 of Thomas) as compared to nucleotides 1006 to 1035 of the instant claimed SEQ ID NO:1, has 90% sequence identity (27 of 30 residues similar) to SEQ ID NO:1.

Regarding claims 88 and 96, the Patent Office alleges that the phrase "comprising a sequence" can be interpreted to mean two nucleotides all the way up to the full length nucleic acid sequence of SEQ ID NO:1. Claim 88, as amended, reads:

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Claim 88 (currently amended): A method for modifying small molecules, comprising

providing a polypeptide encoded by a polynucleotide comprising a sequence having at least about 70% identity to SEQ ID NO:1 and encoding a polypeptide having an endoglucanase activity,

providing a small molecule; and

mixing the polypeptide with the small molecule to produce a modified small molecule.

As noted above, SEQ ID NO:1 is a nucleic acid 1662 residues in length. Even if a 30 residue long nucleic acid has 100% identity to a 30 residue fragment of SEQ ID NO:1, it can only have about 2% sequence identity to SEQ ID NO:1. Thus, the cited 30 nucleotide fragment 1925 to 1954, SEQ ID NO:6, of Thomas can have no more than 2% sequence identity to the claimed SEQ ID NO:1. Accordingly, Thomas does not teach a polypeptide encoded by a polynucleotide comprising a sequence having at least about 70% identity to SEQ ID NO:1.

Regarding claim 96, as amended, it reads:

Claim 96 (currently amended): A method for modifying a small molecule comprising:

providing a polypeptide having an endoglucanase activity, wherein the polypeptide is encoded by a nucleic acid comprising a sequence as set forth in SEQ ID NO:1;

providing a small molecule; and

mixing the polypeptide with the small molecule to produce a modified small molecule.

Claim 96 is directed to a method comprising providing a polypeptide having an endoglucanase activity that is encoded by a nucleic acid comprising a sequence as set forth in SEQ ID NO:1. SEQ ID NO:1 is a nucleic acid 1662 residues in length.

As noted above, Applicants wish to clarify that they use the term "comprises" as an open-ended term. Thus, the plain meaning of the claim reads on use of a nucleic acid at least comprising a sequence as set forth in SEQ ID NO:1, i.e., a nucleic acid at least 1662 residues in length having the sequence of SEQ ID NO:1.

As noted above, Thomas only teaches a 30 nucleotides residue sequence having 90% sequence identity to a 30 residue fragment of SEQ ID NO:1. Even if the cited fragment of Thomas

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were 100% identical to a 30 residue fragment of SEQ ID NO:1, it could only have about 2% sequence identity to SEQ ID NO:1.

Thus, Thomas is not a single prior art reference that teaches each and every element of the claim 96.

As noted above, the Patent Office alleges that a sequence taught by Thomas, the 30 nucleotides residues numbered 1925 to 1954 of SEQ ID NO:6 of Thomas, as compared to nucleotides 1006 to 1035 of the instant claimed SEQ ID NO:1, has 90% sequence identity (27 of 30 residues similar) to SEQ ID NO:1. The instant amendment addresses this issue. Claim 95, as amended, reads:

Claim 95 (currently amended): A method for modifying a small molecule comprising:

providing a polypeptide having an endoglucanase activity, wherein the polypeptide is encoded by a nucleic acid comprising at least 75 consecutive residues of a sequence having at least about 70% sequence identity to a sequence as set forth in SEQ ID NO:1;

providing a small molecule; and

mixing the polypeptide with the small molecule to produce a modified small molecule.

Similarly, claim 112, as amended, reads:

Claim 112 (currently amended): A method for modifying a small molecule such that the small molecule will have a desired activity comprising:

providing a polypeptide having endoglucanase activity, wherein the polypeptide is encoded by a nucleic acid having at least about 70% sequence identity to a sequence as set forth in SEQ ID NO:1;

providing a small molecule;

mixing the polypeptide with the small molecule to produce a modified small molecule; and,

testing the modified small molecule for the desired activity.

Applicants respectfully submit that because Thomas is not a single prior art reference that teaches each and every element of the claimed invention, the claimed invention is not anticipated by Thomas. Accordingly, Applicants respectfully request reconsideration and withdrawal of the rejection of the claims under 35 U.S.C. §102(e) as allegedly anticipated by Thomas.

Issues under 35 U.S.C. §103

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Stemmer, U.S. Patent No. 6,277,638, in view of Knowles

Claims 42 to 55, 93, 94, 97, 98, 100, 111, are rejected under 35 U.S.C. §103(a) as allegedly unpatentable over Stemmer, U.S. Patent No. 6,277,638, in view of Knowles.

The Patent Office states that Stemmer does not teach a nucleic acid as cited in claim 42, and that Knowles cures this defect in Stemmer by teaching a sequence having at least about 50% sequence identity to a sequence as set forth in SEQ ID NO:1.

The instant amendment addresses this issue. As amended, claim 42 reads:

Claim 42 (currently amended): A method of generating a nucleic acid encoding an endoglucanase comprising:

obtaining a nucleic acid encoding an endoglucanase comprising a sequence having at least about 70% sequence identity to a sequence as set forth in SEQ ID NO:1, or sequences complementary thereto; and

modifying one or more nucleotides in said sequence to another nucleotide, deleting one or more nucleotides in said sequence, or adding one or more nucleotides to said sequence.

Knowles does not teach a nucleic acid encoding an endoglucanase comprising a sequence having at least about 70% sequence identity to a sequence as set forth in SEQ ID NO:1. Accordingly, because Knowles does not cure the defect in Stemmer to teach the method of claim 42, the rejection of claim 42 under 35 U.S.C. §103(a) as allegedly unpatentable over Stemmer in view of Knowles can be withdrawn.

The Patent Office also notes that it has interpreted the phrase "comprising a sequence" in claim 42 broadly to mean two nucleotides. As discussed above, Applicants have used the term "comprising" as an open-ended term, and respectfully note that a 30 residue fragment such as that cited taught by Knowles can have at most about 2% sequence identity to SEQ ID NO:1 (which is a nucleic acid 1662 residues in length).

Claim 93 has been amended to read:

Claim 93 (currently amended): A method of generating a nucleic acid encoding an endoglucanase comprising:

obtaining a nucleic acid encoding an endoglucanase, wherein the nucleic acid comprises at least 75 consecutive residues of a sequence having at least about 70%, 75%, 80%, 85%, 90%, 95%, 96%, 97%, 98% or 99% sequence identity to a sequence as set forth in SEQ ID NO:1 or sequences complementary thereto; and

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modifying one or more nucleotides in the sequence to another nucleotide, deleting one or more nucleotides in the sequence or adding one or more nucleotides to the sequence.

As discussed above, Knowles does not teach a nucleic acid encoding an endoglucanase comprising a sequence comprising at least 75 consecutive residues of a sequence having at least about 70% sequence identity to a sequence as set forth in SEQ ID NO:1. Accordingly, because Knowles does not cure the defect in Stemmer to teach the method of claim 93, the rejection of claim 93 under 35 U.S.C. §103(a) as allegedly unpatentable over Stemmer in view of Knowles can be withdrawn.

Claim 94 reads:

Claim 94 (previously presented): A method of generating a nucleic acid encoding an endoglucanase comprising:

obtaining a nucleic acid comprising a sequence as set forth in SEQ ID NO:1 or sequences complementary thereto; and

modifying one or more nucleotides in the sequence to another nucleotide, deleting one or more nucleotides in the sequence or adding one or more nucleotides to the sequence.

As discussed above, Applicants have used the term "comprising" as an open-ended term, and respectfully note that a 30 residue fragment such as that cited taught by Knowles can have at most about 2% sequence identity to SEQ ID NO:1 (which is a nucleic acid 1662 residues in length). Thus, Knowles does not teach a nucleic acid encoding an endoglucanase comprising a sequence as set forth in SEQ ID NO:1. Accordingly, because Knowles does not cure the defect in Stemmer to teach the method of claim 94, the rejection of claim 94 under 35 U.S.C. §103(a) as allegedly unpatentable over Stemmer in view of Knowles can be withdrawn.

Claim 111, as amended, reads:

Claim 111 (currently amended): A method of generating and identifying a nucleic acid encoding a polypeptide having endoglucanase activity comprising:

obtaining a nucleic acid encoding an endoglucanase comprising a sequence having at least about 70% sequence identity to a sequence as set forth in SEQ ID NO:1 or sequences complementary thereto;

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modifying one or more nucleotides in the sequence to another nucleotide, deleting one or more nucleotides in the sequence, or adding one or more nucleotides to the sequence; and

identifying a modified nucleic acid encoding a polypeptide having endoglucanase activity.

As discussed above, Knowles does not teach a nucleic acid encoding an endoglucanase comprising a sequence having at least about 70% sequence identity to a sequence as set forth in SEQ ID NO:1. Accordingly, because Knowles does not cure the defect in Stemmer to teach the method of claim 111, the rejection of claim 111 under 35 U.S.C. §103(a) as allegedly unpatentable over Stemmer in view of Knowles can be withdrawn.

Stemmer in view of Thomas

Claims 42 to 55, 93, 94, 97 to 104, 110 and 111, are rejected under 35 U.S.C. §103(a) as allegedly unpatentable over Stemmer in view of Thomas.

The Patent Office states that Stemmer does not teach a nucleic acid as cited in claim 42, and that Thomas cures this defect in Stemmer by teaching the nucleic acid sequence used in the methods of claims 42 to 55, 93, 94, 97 to 104, 110 and 111.

However, as discussed above, Thomas does not teach a nucleic acid encoding an endoglucanase comprising a sequence: having at least about 70% sequence identity to a sequence as set forth in SEQ ID NO:1 (claims 42 and 111); at least 40 consecutive residues of a sequence having at least about 70% sequence identity to a sequence as set forth in SEQ ID NO:1 (claim 93); or, comprising a sequence as set forth in SEQ ID NO:1 (claim 94). Accordingly, because Thomas does not cure the defect in Stemmer to teach the method of claims 42 to 55, 93, 94, 97 to 104, 110 and 111, their rejection under 35 U.S.C. §103(a) as allegedly unpatentable over Stemmer in view of Thomas can be withdrawn.

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CONCLUSION

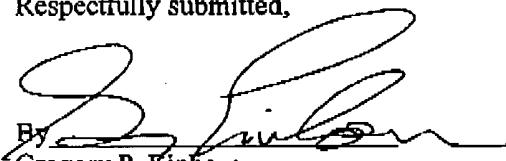
In view of the foregoing amendment and remarks, it is believed that the Examiner can properly withdraw the rejection of the pending claims under 35 U.S.C. §112, second paragraphs, 35 U.S.C. §102, and 35 U.S.C. §103. Applicants believe all claims pending in this application are in condition for allowance. The issuance of a formal Notice of Allowance at an early date is respectfully requested.

Applicants believe that no additional fees are necessitated by the present response and amendment. However, in the event any such fees are due, the Commissioner is hereby authorized to charge any such fees to Deposit Account No. 03-1952 referencing attorney docket no. 564462000520. Please credit any overpayment to this account.

As noted above, Applicants have requested a telephone conference with the undersigned representative to expedite prosecution of this application. After the Examiner has reviewed the instant response and amendment, please telephone the undersigned at (858) 720-5133.

Dated: August 5, 2004

Respectfully submitted,


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